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• E.I.S. S.p.A.

20099 Sesto S. Giovanni MI (IT)

(71) Applicants:

- Microflight S.r.l.  
20092 Cinisello Balsamo MI (IT)

(72) Inventor: Faita, Marco

20092 Cinisello Balsamo MI (IT)

(74) Representative: Concone, Emanuele et al

Società Italiana Brevetti S.p.A.

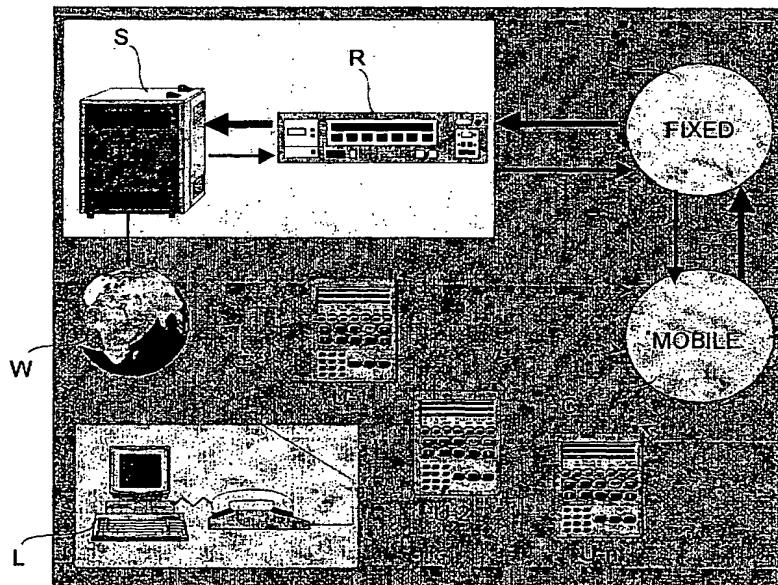
Via Carducci 8

20123 Milano (IT)

**(54) Method and apparatus for collecting and transmitting the results of votes**

(57) An apparatus for collecting and transmitting the data of votes includes a central server S connected through a mobile phone network C to a plurality of n portable units U located one in each polling station. Each portable unit U includes a keyboard, a display, a memory and a digital transceiver system and is directly programmed by server S according to the operational co-ordinates transmitted to the server upon activation of the

unit. During the counting process, the user only has to strike the key corresponding to the value of the scrutinized ballot and as soon as the counting session is completed he can send immediately to server S the relevant results. Thanks to this method of centralized programmation and automatic vote counting, both the risks of errors and the time required for collecting and forwarding the data are greatly reduced.

**Fig.2**

**Description**

[0001] The present invention relates to systems for collecting and transmitting data, and in particular to a method and apparatus intended for collecting and transmitting the data of votes such as elections, referendums, political and commercial surveys, etc. Reference will be made hereafter specifically to the application of the present invention to the counting of votes of administrative elections, but it is clear that what is being said is readily adaptable to other types of votes such as referendums, regional, provincial, municipal elections and the like and to any type of political and commercial survey.

[0002] It is known that, upon conclusion of the voting, inside the polling station there is provided the step of checking and counting the votes, and there is the need to know and list the result of the vote as soon as possible and to transmit it to a data collecting headquarter.

[0003] In practice, this means that during the counting process someone must open the ballot-papers, read their content, assign a value (valid vote, void vote, blank ballot) by declaring it out loud and subsequently recording it in a report, file it and, at the end of the counting session, transmit it outside the polling station.

[0004] This process of collecting, filing and listing the data is carried out completely manually with evident drawbacks as to lengthiness and possibility of errors in the counting and/or in the sending of the results.

[0005] Therefore the object of the present invention is to provide a method and apparatus suitable to overcome said drawbacks.

[0006] This object is achieved by means of a method and apparatus which automatize the process of counting the votes and forwarding the data while leaving to the scrutineer only the task of assigning to each ballot the relevant value.

[0007] A first evident advantage of the present invention is that it greatly reduces the risk of errors in counting and forwarding the data, in that the only remaining source of error is the erroneous assigning of the value by the scrutineer.

[0008] Another clear advantage is the greater velocity in collecting and forwarding the data which allows to have the results almost in real time.

[0009] These and other advantages and characteristics of the method and apparatus according to the present invention will be clear to those skilled in the art from the following detailed description of an embodiment thereof, with reference to the annexed drawings wherein:

Fig.1 shows a portable unit which makes part of the present apparatus; and

Fig.2 diagrammatically illustrates the complete apparatus and its operation.

[0010] With reference to fig.1, there is illustrated a

portable unit which substantially includes a keyboard K, a display D, a memory and a digital transceiver system indicated by antenna A, e.g. a GSM module. In particular, keyboard K is preferably of the membrane type and divided into an upper portion including a plurality of programmable function keys F (F1-F7 in the illustrated example) and other operational keys, and a lower portion including a numerical keyboard and three system keys. The use of these keys will be made clear later on upon explanation of the operation of the apparatus.

[0011] As shown in fig.2, the above-described portable unit makes part of a plurality of  $n$  units U located one in each polling station and connected through the transceiver module to a central unit S (server). This connection is preferably achieved through a mobile phone network C, which forwards the transmission to the fixed phone network T to which server S is connected through a router R which handles the lines. The communications from the portable units U to server S are represented by the thick black arrows P whereas those in the opposite direction by the thin arrows N. Also, server S is preferably connected to a global communication network W (typically the Internet) so as to allow access to the collected data also to remote users L.

[0012] The operation of the apparatus above will now be described also with reference to the method devised for the intended object.

[0013] The first step of the present method is the creation of an electronic database, stored in server S, of the lists of all parties, coalitions and candidates which enter the electoral competition, said lists being possibly multiple depending on the voting system in use and on the type of vote. For example, for administrative elections in Italy you would presently have a list of the parties entered in the proportional share of the House of Representatives, a list of the coalitions and candidates entered in the majority share of the House of Representatives and a list of the coalitions and candidates entered in the majority share of the Senate.

[0014] In every list an arbitrary code is assigned to each party, coalition or candidate, according to the various candidatures applied for in each electoral ward and constituency. In this way it is possible to unambiguously identify the corresponding political entity and to add up the vote results of every polling station without possibility of error. Moreover, the preliminary preparation of the electronic lists in a single place, carried out by qualified personnel, eliminates the possibility of making errors in assigning the code to the political entity.

[0015] Server S also stores a list of identification codes of each portable unit U to which corresponding user-settable keywords are coupled. Together with the data relating to the number of the electoral ward and of the polling station, these codes make up the operational coordinates which allow server S to select from the database the pertinent lists to be sent to each unit U.

[0016] In practice, every user in order to be able to receive the electronic lists on his unit U must first input

the relevant user identification code, the keyword, the electoral ward number and the polling station number. This input is carried out by means of the numerical keyboard and "ENTER" key in the lower portion of keyboard K, and once these data have been input it is sufficient to strike the "SEND" key to send them to server S (arrows P). The latter receives and checks the operational coordinates and picks out from its general electronic lists all and only the useful elements and information relating to the desired electoral ward (abbreviations of the parties, names of the candidates for Senate and House, etc.).

[0017] The transmission from server S to unit U (arrows N) of the thus selected lists results therefore in the complete programmation of the unit in a simple and error-free way. Each of the F1-F7 function keys is coupled with the abbreviation of one of the parties present in that specific electoral ward, thus allowing to take into account also local or regional parties. It is clear that when the number of parties is greater than that of the available function keys each key will be coupled to more than one party, and the choice of the relevant series of parties will take place through the left/right shifting keys (horizontal arrows). The other keys are used for counting the blank ballots (BLANK), the void votes (VOID) and for the functions of correction, selection, setup, etc.

[0018] During the counting process, the user only has to strike the key corresponding to the value of the scrutinized ballot (F1-F7, BLANK, VOID) and in the memory of unit U there will be an automatic increase of one unit in the number of votes previously stored in relation to the corresponding code.

[0019] This activity is defined "session" and in the course of each vote there may be several sessions, as in the case of counting the ballots relating to the proportional share at the House of Representatives (first session, illustrated in fig.1) or to the majority share at the House of Representatives (second session) or to the majority share at the Senate (third session). At the end of each session, the user can indicate its conclusion through the relevant "END SESSION" key and then proceed to a new session through the "CHANGE SESSION" key, or immediately send to server S the data relating to the completed session through the "SEND" key.

[0020] In the case of void vote it is preferable to show up on display D a list of reasons among which to select the most pertinent (e.g. multiple vote, irregular signs, etc.) so as to obtain an even more accurate report of the count.

[0021] The data collected by all units U-1, U-2, ..., U-n are then forwarded (arrows P) almost in real time to server S which subsequently processes them in order to obtain the results at national, regional, provincial level and the like.

[0022] It is clear that the above-described and illustrated embodiment of the apparatus according to the invention is just an example susceptible of various modifications. In particular, the members making up unit U

may be of any kind suitable for the purpose and/or replaced by other equivalent elements.

[0023] For example, the programmable function keys F could be replaced by a sensitive display of the "touch-screen" type on which the abbreviations of the parties are displayed, and also the other keys could be different in number or have a different arrangement. Similarly, the communication system could be different from a GSM module (e.g. UMTS) and possibly provide a direct connection to server S, e.g. through a satellite link.

### Claims

15. 1. An apparatus for collecting and transmitting the data of votes **characterized in that** it includes a central unit (S), containing a database, connected through a telecommunication network to a plurality of portable units (U), each of said portable units (U) including a transceiver system for the connection to said central unit (S), a keyboard (K), a display (D) and a memory which can be directly programmed by the central unit (S).
20. 2. An apparatus according to claim 1, **characterized in that** the connection between the central unit (S) and the portable units (U) is achieved through a mobile phone network (C).
30. 3. An apparatus according to claim 2, **characterized in that** each of said portable units (U) includes a GSM module.
35. 4. An apparatus according to one or more of the preceding claims, **characterized in that** the keyboard (K) of each of said portable units (U) is of the membrane type.
40. 5. An apparatus according to one or more of the preceding claims, **characterized in that** the keyboard (K) of each of said portable units (U) includes a plurality of programmable function keys (F).
45. 6. An apparatus according to one or more of the preceding claims, **characterized in that** the display (D) of each of said portable units (U) is a sensitive display of the "touch-screen" type.
50. 7. A method for collecting and transmitting the data of votes, **characterized in that** it includes the following steps:
  - a) creating an electronic database with all the data relating to the vote, such as lists of parties, coalitions, candidates and so on in the various electoral wards, polling stations and the like;
  - b) assigning a univocal arbitrary code to each record of the database;

- c) creating a list of identification codes univocally corresponding to a plurality of portable units (U);
- d) storing the data of points a), b) and c) in a central unit (S) connected to said portable units (U) through a telecommunication network; 5
- e) sending from each portable unit (U) to the central unit (S) a request for activation containing the operational coordinates of the portable unit (U), which include the identification code and the number of electoral ward, polling station or the like; 10
- f) sending from the central unit (S) to each portable unit (U) a reply to the request for activation containing the instructions for the programming of the portable unit (U) with all and only the data relating to the operational coordinates thereof; 15
- g) increasing by one unit the count of the code mentioned at point b), stored in the memory of the thus programmed portable unit (U), according to the value assigned to each scrutinized ballot; 20
- h) sending from each portable unit (U) to the central unit (S) the total result of the completed counting session. 25

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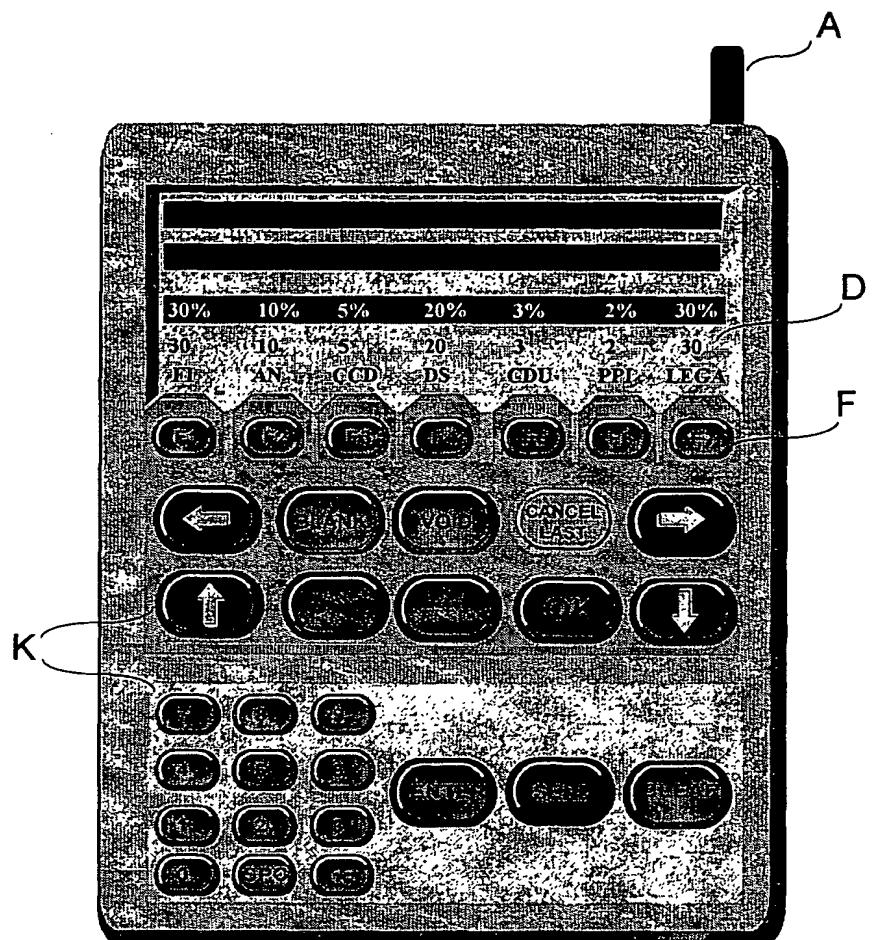


Fig. 1

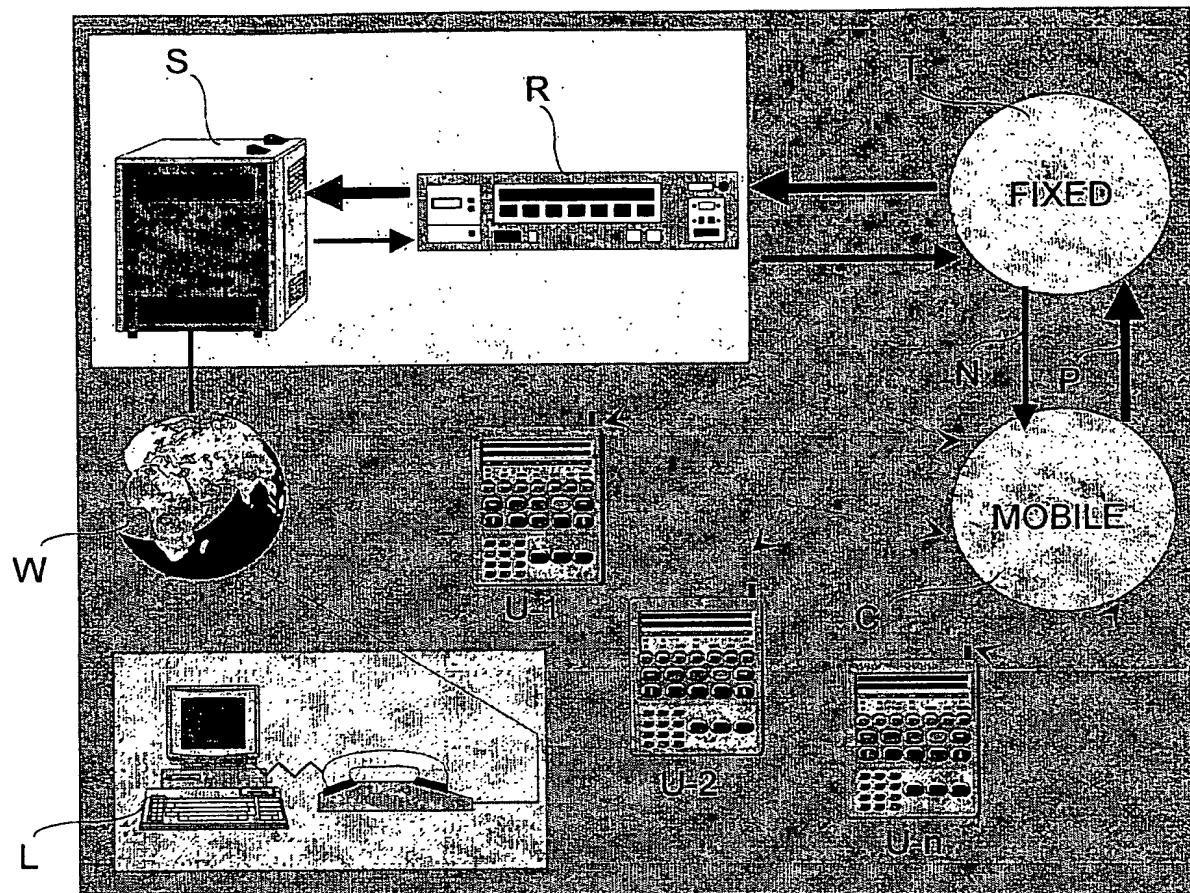


Fig.2



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## EUROPEAN SEARCH REPORT

Application Number  
EP 00 83 0309

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The present search report has been drawn up for all claims			
Place of search  THE HAGUE	Date of completion of the search  21 September 2000	Examiner  Buron, E	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons  & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : Intermediate document			

ANNEX TO THE EUROPEAN SEARCH REPORT  
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